AVL02 User Guide V2.1.8

Automatic Vehicle Location

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1 Product Overview

AVL02 is a GPS/GSM/GPRS tracking device which is specially developed and designed for vehicle real-time tracking and security. With superior GPS and GPRS modules, AVL02 has good sensitivity and stable performance. It can get accurate GPS fix even in remote places.

1.1 Key Features

- **Internal Polymer Lithium Ion Battery in the AVL**

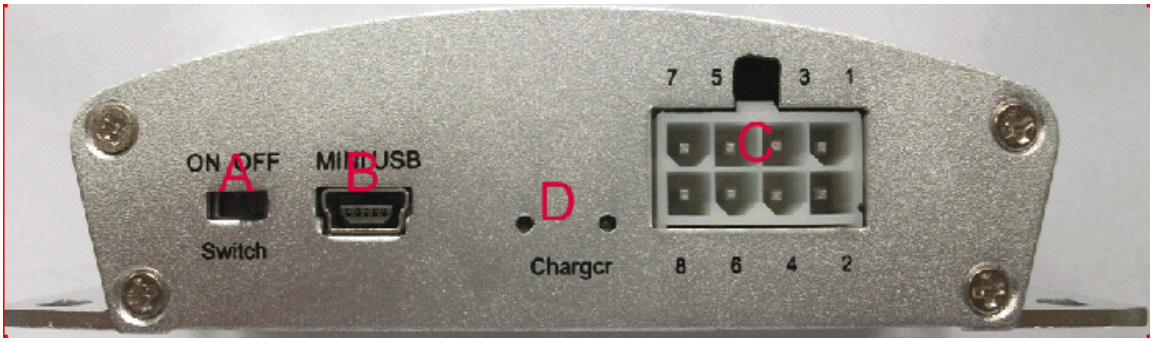
- **Support mini USB port to update firmware**
- **Tracking by time interval via GPRS or SMS**
- **Over-speed alarm**
- **Geo-fence alarm**
- **Low power alarm**
- **Support single location and continual tracking**
- **Can Real-time tracking your vehicle via map on PC**
- **GPRS function, receiving position data and alarm data on Server**
- **Anti-theft alarm, support alarm when someone tremble your car once you park it and send an alarm report to you via SMS or GPRS data**
- **Remotely check the status of the windows or doors close/open, through the 2 switch I/O sockets, and remotely control the status of ignition through the 1 digital I/O socket**
- **SOS button send out exact location for immediate rescue. After user press SOS button in the AVL, AVL unit will send out the location and SOS alarm to the preset number via SMS or a server via GPRS**
- **With 4M memory, which can store about 2000 PCS data. When GPRS is lose connection, those data will be store and send when GPRS connection is recover.**
- **Calculate the odometer of the car from the GPRS data.**
- **Detect the car of the fuel.**

1.2 Specification

Feature	Characteristics
Dimension	108mm*58mm*28mm
N.W	140g
Exterior Power Supply	DC 12V – 24V
Inner lithium battery	DC 3.7V
Standby time	About 72 hours
Work time	About 12 hours
Exterior GSM antenna	Receive GSM signal better

Exterior GPS antenna	**Receive GPS signal better**
Operating Temperature Range	**-20℃ to +60℃**
Air pressure	**860Kpa –1060Kpa**
Humidity	**Up to 75% non-codensing**
Position accuracy	**10 –15 meters**
GSM chip	**support 3 frequency GSM 900/1800 /1900MHZ**
GPS chip	**Sirf-Star III (super-sensitivity and high accuracy)**
Hot start	**1 sec, average**
Warm start	**38 sec, average**
Cold start	**42 sec, average**
Tremble Intensity	
LED	**3 LEDs indicates GSM signal, GPS signal, power on and GSM module.**
Button(not in the basic version)	**1 buttons, report location**
I/O Port	**1 switch input, 2 digital input , 1 digital output, 1 analog input**

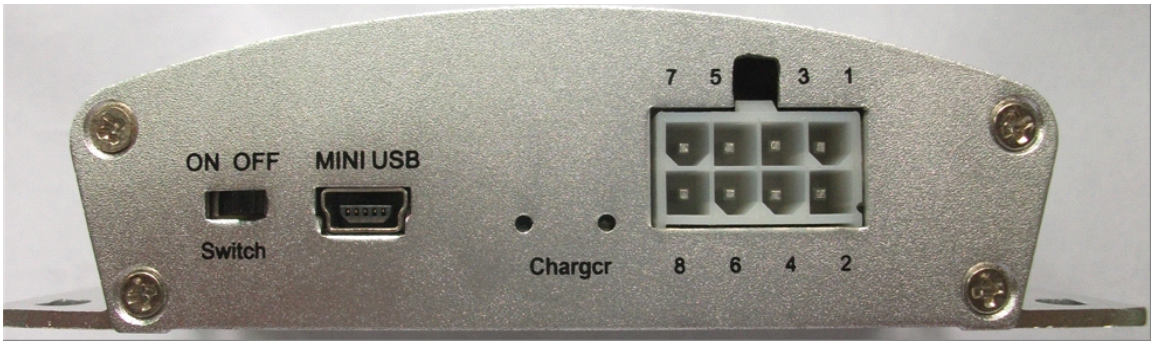
1.3 Outside feature



1.3.1 Socket and Switch

Hardware	Function
A. Switch	Turn on /off the unit
B. USB Port	Support "USB Converter" to update firmware
C. I/O Sockets	Expanding function, as below
D. Power indicator light	When the unit charging, the light is blinking
E. GPS Antenna socket	Connect Exterior GPS Antenna
F. GSM Antenna socket	Connect Exterior GSM Antenna
G. SIM Card Holder	Hold a SIM card
H. Three LED	GSM LED(Right), Power& tremble Led, GPS Led
J. Yellow plastic Pin	Press it to pop up the SIM Card Holder

1.3.2 I/O ports



7)+12V	5)Digital Input 1 （Positive Input 1）	3)Digital Input 2 （Positive Input 2）	1)Analog Input （ADA input）
8)GND	6)SOS Button (With GND)	4)Digital Output A	2)Digital Output B

The function is as below:

NO.	Function
I/O 01	Analog Input to detect the voltage
I/O 02	Connect to Relay to control the Cut Current function
I/O 03	When this cable triggered by high voltage, Device will send a GPRS alarm data to

	Server. And when connect lost, Device also will send a GPRS alarm data to server. The alarm type is"52","53". Use to Detect Car Switch Status
I/O 04	Connect to Relay to control the Cut Current function
I/O 05	The function is the same as I/O 3, but the alarm type is "50", "51". Use to Detect Car Door Status. *At present, most of customers use this cable to connect to the engine of car.
I/O 06	When SOS Button cable is connected to GND(port 08), namely trigger, the unit will send out a data via SMS or GPRS, alarm type is "01"
I/O 07	The anode of power input socket(+12V)
I/O 08	GND, the voltage is '0', The cathode of power input socket

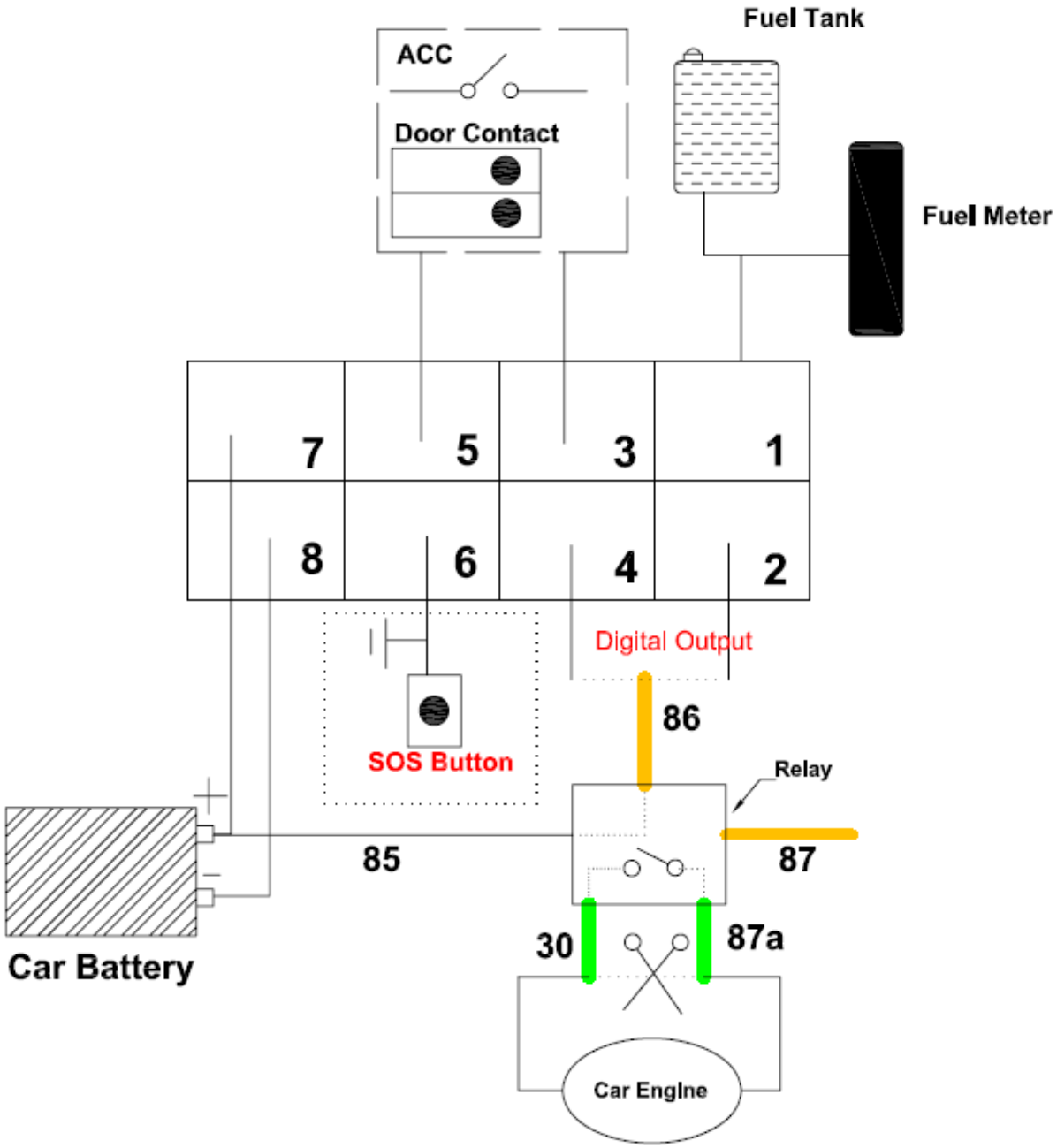
Note: The port that no mark is leaving to customize.

1.3.3 LED Indicators

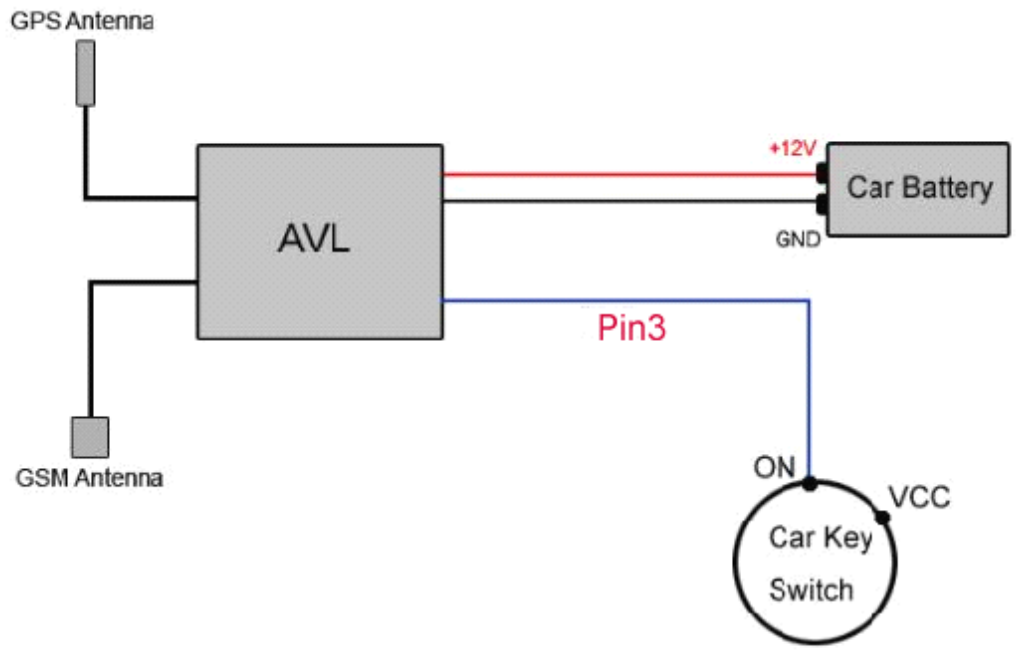
LED	State	Description
GPS Indicator (Blue LED)	light 0.1s dark 2.9s	GPS Signal Well
	light 1s dark 2s	No GPS Signal
	light 0.5s dark 0.5s	GPS Fault
Tremble Indicator (Red LED)	light 0.1s dark 0.1s	System Initial
	light 1s dark 2s	Low Power
	light 0.1s dark 2.9s	Power Good
	always light	On Tremble
GSM Indicator (Green LED)	light 0.1s dark 0.1s	System Initial
	light 0.1s dark 2.9s	GSM Signal Well
	light 1s dark 2s	No GSM Signal
	always dark	No SIM Card Or Bad SIM Card
	light 0.1s dark 0.1s (flash three times)	Call Ring
	always light	In A Call
	light 0.1s dark 0.3s (flash five times)	Send A SMS
	light 0.1s dark 0.3s (flash five times)	Receive A SMS
	light 0.1s dark 1s	Connect to GPRS

When AVL is in work mode, if GSM signal is in good state, the green led will flash, similarly, if GPS signal is in good state, the blue led will flash, if the green led is not flashing, that indicates the GSM signal is not good, if the blue led is not flashing, then you should check if there is something upon the GPS antenna top. Further, if you find the three LEDs are dark, maybe the AVL entered into "sleep-mode" or there is no power in the AVL unit.

Ports Graphics



1.3.4 Detect Car ON/OFF



Connect AVL Pin6 to the Car Key Switch , to the ON point.

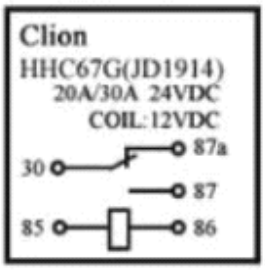
When Car Switch On, AVL will send Alarm to Server, type is 52

When Car Switch Off, AVL will send Alarm to Server, type is 53

When finish this connect, in every GPRS data will have the state of Engine

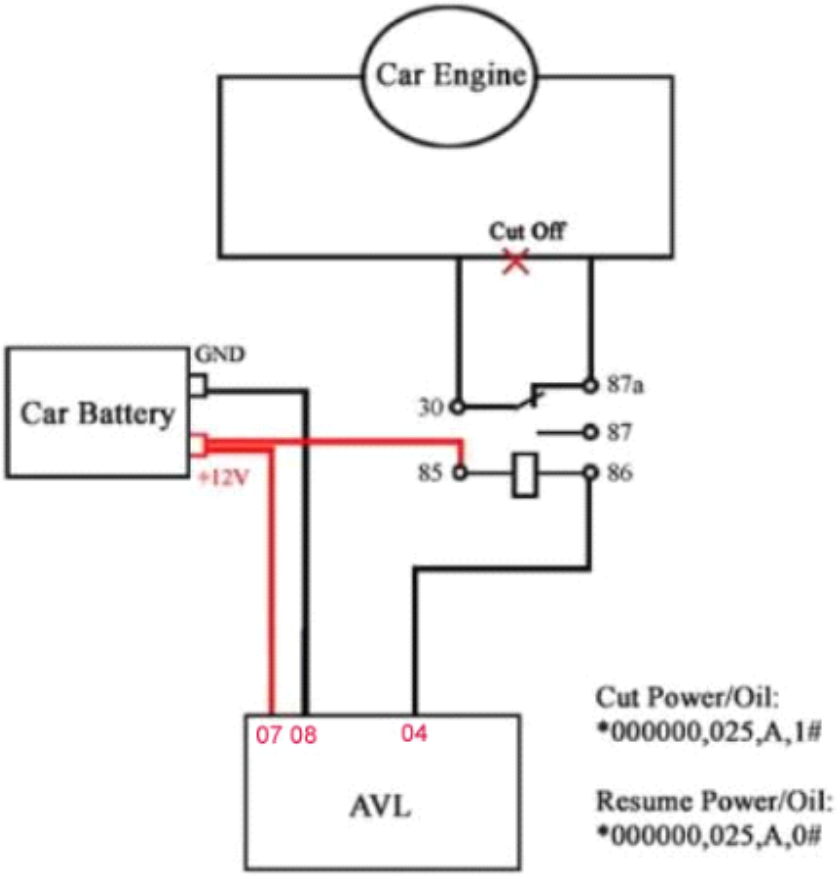
1.3.5 Connect Relay to control the Car Oil/Power

Diagram Of Relay



Step:
1.Connect AVL port 08 to Car Battery +12V
2.Connect AVL port 04 to GND
3.Cut off the circle of Car Engine
4.Relay port 30 and port 87a connect to Car Engine
5.Relay port 85 connect to Car Battery +12V power
6.Relay port 86 connect to AVL port 02

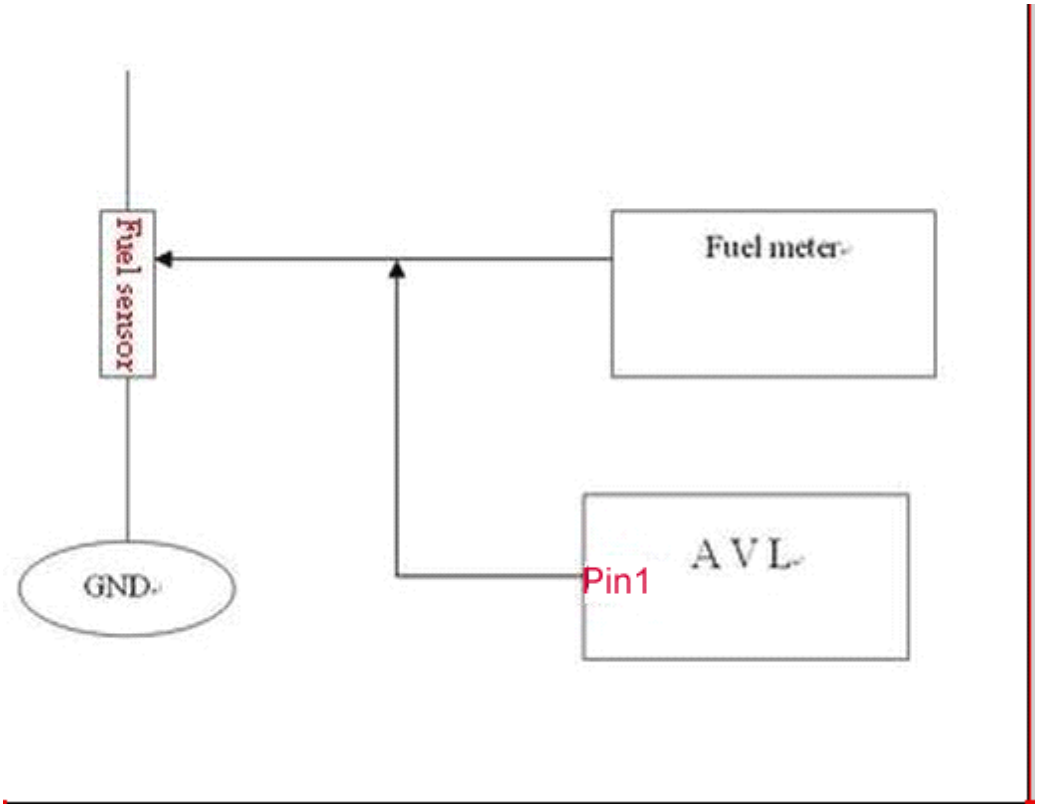
Diagram Of AVL



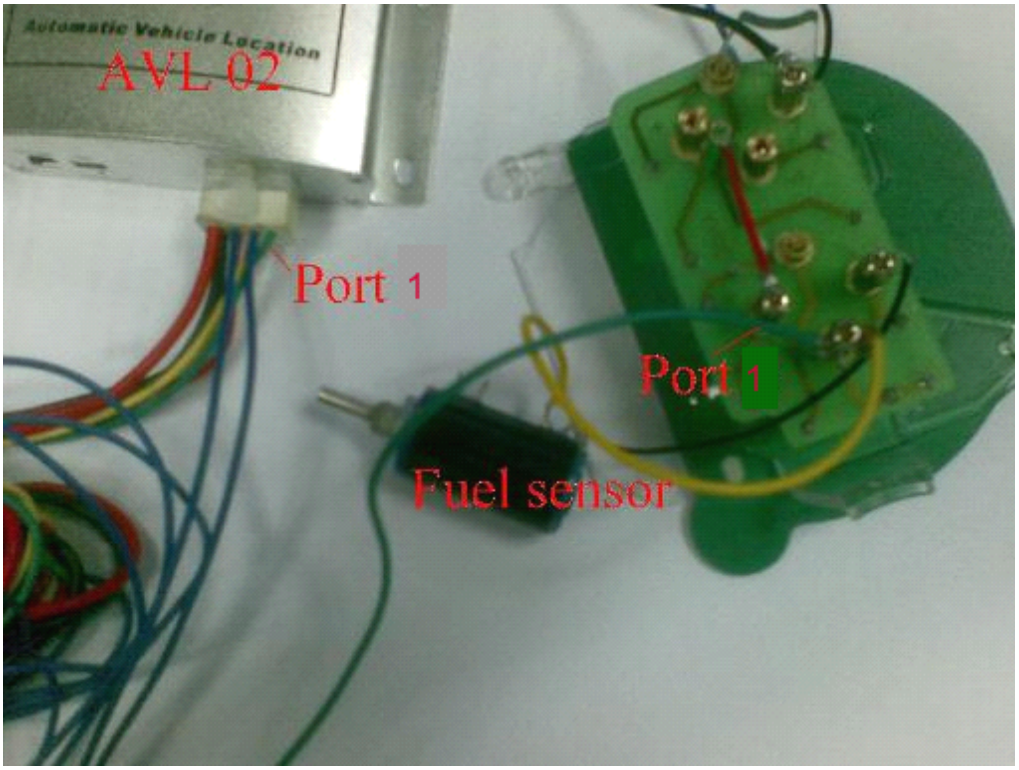
Cut Power/Oil:
*000000,025,A,1#

Resume Power/Oil:
*000000,025,A,0#

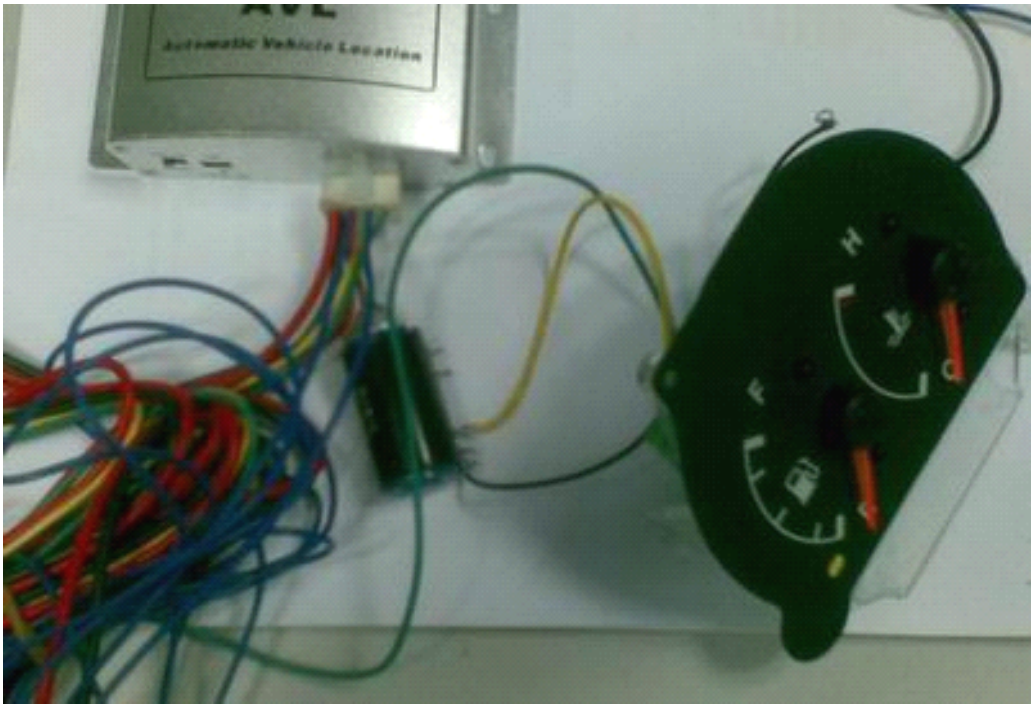
1.3.6 Connect to the fuel sensor to detect the fuel.



Our AVL can get the voltage by the AD collection and according to the voltage change to know the fuel level in the tank. because the fuel tank in different car is different .so you need to find out the different relation between the voltage and fuel .our AVL can collect the voltage from 0-18V.so that mean if you want to know the fuel leave in the fuel tank, so you should work out the coordinate relation between voltage and fuel in your server. When the GPRS data send to the server, the server work out fuel level in the tank by analyze the GPRS data.



Picture 1 (how to connection)



Picture 2 (About the fuel meter)

2. How to use the Product

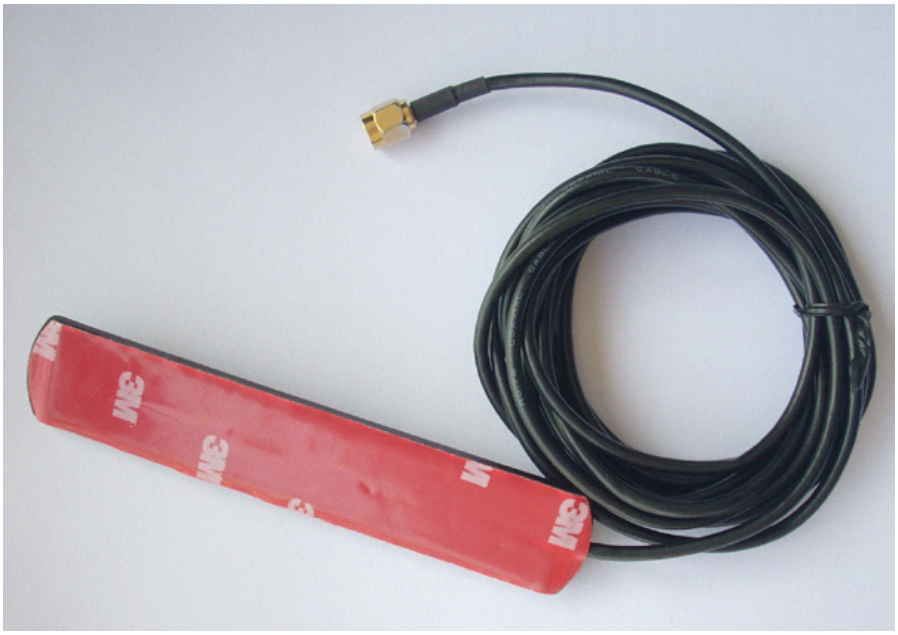
2.1 Prophase to prepare

Step1: Inset a SIM card.

Make sure the SIM card can communicate with other cards via SMS and call, and before installing the SIM card to the holder, please use a mobile phone to empty the SMS storage of the card

Step2: Connect GSM Antenna and GPS Antenna to AVL unit.

(GPS Antenna)



(GSM Antenna)

When you connect to the GSM and GPS antenna,pls make sure that it is until the connection is very firm.

Step 3: Fix the AVL and connect to the exterior power by 12V.

Pls refer to the introduction about I/O port, port7 and port 8 apart connect to the exterior power of anode and cathode.

Step 4: Turn on the AVL, observe the three LEDs in the AVL.

Turn on the AVL, you will see the three LEDs flash at the same time.

It entered into initial mode.

After about 1 mins, the device will work normal, then you could look the LEDs of status and refer to the introduction about 1.3.3 led indicators.

When AVL is in work mode, if GSM signal is in good state, the green led will flash, similarly, if GPS signal is in good state, the blue led will flash, if the green led is not flashing, that indicates the GSM signal is not good, if the blue led is not flashing, then you should check if there is something upon the GPS antenna top. Further, if you find the three LEDs are dark, maybe the AVL entered into "sleep-mode" or there is no power in the AVL unit.

Notes: As everyone knows, the GPS signal is very weak or have no GPS signal in the office .So pls put the AVL02 to the open air in order to receive the great GPS signal.

2.2 Use the command to set device by SMS

Notes: $$$$$$ is the password, and the default is: 000000

If you want to modify the password:

The command of format:

***$$$$$$,001,@@@@@@#**

Explication: $$$$$$: the old password

@@@@@@: the new password

For example: *000000,001,123456#

After you send the command of SMS to device, it will reply to your mobile phone: Receive:'001'OK

***000000,001,123456#**

2.2.1 Use the GPRS function

Notes: At first of all, make sure the SIM card insert to the device and have the GPRS function.

Step1: Set the APN(Access Point Name)

Different network of provider have the different APN at every country, if you don't know, pls refer to the attachment.

Format: *$$$$$$,011,APN,Username,Password#

Notes: The username and password could to be null1.

For example: *000000,011,cmnet,,#

Explication: The China Mobile's APN is "cmnet", and the username and password are empty.

After you send the command of SMS to device, it will reply to your mobile phone: Receive:'011'OK

***000000,011,cmnet,,#**

Step2: Set the server's IP & PORT

Format: *$$$$$$,015,0,IP,PORT#

For example: *000000,015,0,72.167.29.18,3308#

72.167.29.18 is our server's IP address, 3308 is the port.

If client have the server by himself, pls make sure the IP and port is correct.

After you send the command of SMS to device, it will reply to your mobile phone:

Receive:'015'OK

***000000,015,0,72.167.29.18,3308#**

Step3: Set Time Interval GPRS

Format: *$$$$$$,018,X,Y#

X: the time interval (unit: sec), Y: the times of the data have to send by GPRS.

For example:*000000,018,60,999#

The device will send GPRS every 1 mins and no times limit.

After you send the command of SMS to device, it will reply to your mobile phone: Receive:'018'OK

***000000,018,60,999#**

Step4: Open the GPRS function

Format: *$$$$$$,016,X#

X: close/open the GPRS function,

For example: *000000,016,1#

After you send the command of SMS to device, it will reply to your mobile phone: Receive:'016'OK

*000000,016,1#

2.2.2 Set the sleep mode

Step1: open the sleep mode and the tremble sensor

Format: *$$$$$$,021,XY#

X: close/open the sleep mode

Y: close/open the tremble sensor

For example: *000000,021,11#

When you want to use the sleep mode of function, make sure open the sleep mode and the tremble sensor

After you send the command of SMS to device, it will reply to your mobile phone: Receive:'021'OK

*000000,021,11#

Step2: set the time of no tremble into the sleep.

Format: *$$$$$$,044,X#

X: After the tremble sensor don't tremble for X second, tracker will into sleep mode(unit: sec)

For example: *000000,044,60#

If the device doesn't tremble for 60 sec, the device will into the sleep mode.

After you send the command of SMS to device, it will reply to your mobile phone: Receive:'044'OK

*000000,044,60#

Step 3: set the time of tremble to wake up the device

Format: *$$$$$$,043,X#

X: After the tremble sensor continuous tremble for X second, device will wake up.

For example: *000000,043,30#

If the tremble sensor continue tremble for 30 sec, device will wake up.

After you send the command of SMS to device, it will reply to your mobile

phone: Receive:'043'OK

***000000,043,30#**

2.2.3 Set the interval SMS

Step1: Set the SOS number

Format: *$$$$$$,003,0,F,CallNumber,SMS Number#

When the device send to SMS to mobile phone by interval, should to set a SOS number which the number of the mobile phone to receive the data.

For example: *000000,003,0,1,008613800755500, 008613800755500##

When set the SOS number, pls append the 00 and international number as the example.86 is the international number for china.

After you send the command of SMS to device, it will reply to your mobile phone:

Receive:'003'OK

***000000,003,0,1,008613800755500, 008613800755500#**

Step2: Set the interval time for SMS.

Format: *$$$$$$,002,X,Y#

X: Time interval (unit:mins)

Y: the times of the data have to send by SMS

For example: *000000,002,1,999#

The device will send SMS every 1 mins and no times limit.

After you send the command of SMS to device, it will reply to your mobile phone:

Receive:'002'OK

***000000,002,1,999#**

2.2.4 Other useful commands

- **Get current location:**
  ***$$$$$$,000#**

- **Get the IMEI from the device:**
  ***$$$$$$,801#**

- **Reboot the device by SMS:**
  ***$$$$$$,991#**

- **Initialization the device**
  ***$$$$$$,990,099#**

3 The format of the GPRS

The GPRS command server sent to device must be 8-bit ASCII format. The GPRS command must be same as sms command in this user guide.

The data of the device send to the server:

Format：$$(2 Bytes) + Len(2 Bytes) + IMEI(15 Bytes) + | + Alarm Type(2 Bytes) + GPRMC + | + PDOP + | + HDOP + | + VDOP + | + Status(12 Bytes) + | + RTC(14 Bytes) + | + Voltage(8 Bytes) + | + ADC(8 Bytes) + | + LACCI(8 Bytes) + | + Temperature(4 Bytes) | + Mile-meter(14 Bytes)+ | Serial(4 Bytes) + | + Checksum (4 Byte) + \r\n(2 Bytes)

The format of ASCII:

$$B0353358019462410|AA$GPRMC,102156.000,A,2232.4690,N,11403.6847,E,0.00,,180909,,*15|02.0|01.2|01.6|000000001010|20090918102156|14181353|00000000|279311AA|0000|0.7614|0080|D2B5

Code	Explanation
$$	2Bytes, indicates header of command from tracker unit to call centre, in ASCII code (hex is 0x24).
Len	2Bytes, indicates length of all command, including header and end (the array is first high to low).

IMEI	15Bytes, at most 20 bytes.
Alarm type	2Bytes, the GPRS data trigger type.
DATA	GPRMC string
	PDOP
	HDOP
	VDOP
	Status (12bytes)
	RTC (14bytes)
	Voltage(8bytes)
ADC	8bytes, the ADC value.
LACCI	Location information elements
Temperature	Temperature information
Odometer	Mileage data
Serial ID	4bytes, sign every GPRS data, the range is [0001-9999], then circle it again from 0001 to 9999.
Checksum	4Bytes, means CRC check of all the data ahead, CRC-16 modbus (Polynomial = 0xA001， initialize data is 0xffff) checksum, not including its own byte and end characters. For example: $$B0353358019462410\|AA$GPRMC,102156.000,A,2232.4690,N,11403.6847,E,0.00,,180909,,*15\|02.0\|01.2\|01.6\|000000001010\|20090918102156\|14181353\|00000000\|279311AA\|0000\|0.7614\|0080\|D2B5 D2B5= CRC-16 modbus ($$B0353358019462410|AA$GPRMC,102156.000,A,2232.4690,N,11403.6847,E,0.00,,180909,,*15|02.0|01.2|01.6|000000001010|20090918102156|14181353|00000000|279311AA|0000|0.7614|0080|).
\r\n	2Bytes, end char (hex format is 0x0d, 0x0a).

- Alarm type
  - 0x01 SOS button is pressed
  - 0x49 Button A is pressed
  - 0x09 Auto Shutdown Alarm
  - 0x10 Low battery Alarm
  - 0x11 Over Speed Alarm
  - 0x13 Recover From Over Speed
  - 0x14 Deceleration Alarm
  - 0x15 Acceleration Alarm
  - 0x30 Parking Alarm

  - 0x42 Out Geo-fence Alarm
  - 0x43 Into Geo-fence Alarm
  - 0x50 IO-1 Close —digital input 1 closed
  - 0x51 IO-1 Open —digital input 1 opened
  - 0x52 IO-2 Close —digital input 2 closed
  - 0x53 IO-2 Open —digital input 2 opened
  - 0x54 IO-3 Close （reserve）
  - 0x55 IO-3 Open （reserve）
  - 0x56 IO-4 Close （reserve）
  - 0x57 IO-4 Open （reserve）
  - 0x60 Begin Charge
  - 0x61 End Charge
  - 0x88 Heartbeat
  - 0x91 Into Sleep Mode
  - 0x92 Wakeup From Sleep Mode
  - 0xAA Interval GPRS data
- Status(12 Bytes) —— Status：
  - Byte 01 —— SOS button
  - Byte 02 —— Button A button（reserve）
  - Byte 03 —— Button B button（reserve）
  - Byte 04 —— Button C button（reserve）
  - Byte 05 —— digital Input 1 the status of the digital input 1 **Port 5**(sometimes connect to the engine, Positive Input 1)
  - Byte 06 —— digital Input 2 the status of the digital input 2 **Port 3**(sometimes connect to the door, Positive Input 2)
  - Byte 07 —— digital Input 3（reserve）
  - Byte 08 —— digital Input 4（reserve）
  - Byte 09 —— digital Out 1 Port 4
  - Byte 10 —— digital Out 2 Port 2
  - Byte 11 —— digital Out 3（reserve）
  - Byte 12 —— digital Out 4（reserve）
- Voltage(8 Bytes) ——Value of the voltage：
  - Format：ABBBIIII
  - A —— Charge Status (0 = Off Charge , 1 = On Charge)
  - BBB —— Battery Voltage (For example, 367 mean 3.67V)
  - IIII —— Input Charge Voltage (For example, 1251 mean 12.51V)
- ADC(8 Bytes) —— AD collection：
  - Format：CCCCDDDD
  - CCCC —— AD A collect (For example, 1251 mean 12.51V)
  - DDDD —— ADB collect (For example, 1251 mean 12.51V)（reserve）
- LACCI(8 Bytes) —— Location information elements：
  - Format：LLLLCCCC
  - LLLL —— Location area code
  - CCCC —— Cell ID

- Temperature(4 Bytes) —— Temperature（reserve for the device has no temperature sensor）:
  - Format：STTT
  - Precision is 0.1℃
  - The first byte “S” mean sign， such as“0/1/-”
  - Eg：0345 mean +34.5℃，1234 mean +123.4℃，-123 mean -12.3℃
- Mile-meter(14 Bytes) —— Location information elements：
  - Format is AAAA.BBBBKm.
  - Four bytes after the radix point.
- Serial(4 Bytes) —— Serial number：
  - Format：SSSS
  - Every time reboots the device or reset, the serial number will initialize to 0001.
  - Every GPRS message send out will add one
  - After the serial number to 9999, restart from 0001 again

The link of the explain about the CRC-16(modbus):

http://www.lammertbies.nl/comm/info/crc-calculation.html

4. SMS instruction list.

If you want to know more about the AVL, and design your special AVL, you can refer to the SMS instruction list.
$$$$$$ is user`s password, and initial password is 000000

	SMS Instruction	Format	Note
1	Request one position	*$$$$$$,000#	
2	Modify user password	*$$$$$$,001,@@@@@@#	$$$$$$ is old password @@@@@@ is new Password

3	Set the time intervals of position notice SMS The Position SMS will send to the preset SOS number.	*$$$$$$,002,X,Y#	X (Max 3 Digital) =0, Stop send position SMS =[1,60000] Time interval (Unit: mins) Y (Max 3 Digital) =[1,999）times send SMS Y=0, Disable this function Y=999, continue send SMS
4	Set a preset phone & SMS number for SOS button	*$$$$$$,003,0,F,CallNumber, SMS Number#	F = 0, Disable this function =1, Only send an alarm SMS to the preset SMS Number Notice :Tel Number and SMS Number (must <25 digits)
5	Set low power alarm When the AVL voltage is lower than the preset value, AVL will send one lower power alarm GPRS data to the Preset Server.	*$$$$$$,004,XXX,YYY#	XXX is the low power alarm voltage, eg: 3.8v,XXX=380 YYY is the auto shut down voltage, eg: 3.5v,YYY=350 For example： *$$$$$$,004,380,350#
6	Set over speed alarm When the AVL speed higher than the preset value, AVL will send one over speed alarm GPRS data to the Preset Server.	*$$$$$$,005,S,X,Y,Z#	S=1 Enable speed alarm, S=0 Disable speed alarm. X=[10<XXX<250] (The speed preset value) unit is km/h Y is the times over speed [1,999],unit is second Z=[10,360],(The time interval to send speed alarm) unit is second.
7	Set Geo-fence alarm When the AVL move out preset scope, AVL will send one Geo-fence GPRS data to the Preset Server.	*$$$$$$,006,+lat1,+long1,+lat2,+long2,X,Y#	Lat=[-9000.0000,+9000.0000] Long=[-18000.0000,+18000.0000] X=[10,360] is for time interval send alarm message. Y=0, Disable GEO-fence alarm.

			Y=1, Into GEO-fence alarm. Y=2, Out of GEO-fence alarm. Note:Long1>long2&lat1>lat2 Make sure the position of north latitude and east longitude set it (+),otherwise set it (-) Format:+AAAAA.BBBB Make sure set the two positions have the same digit after comma.
8	Extend setting	*$$$$$$,008,ABCDEFG#	A=0, Disable position report function which get position SMS by Calling A=1, Enable position report function which get position SMS by Calling B=0, Send the SMS in Text format. B=1, Send the SMS in NMEA format. C=1, AVL do NOT hung up when one call incoming C=0, AVL hung up after 4~5 rings when call incoming D=0 E=0, ADB Normal AD collect E=1, ADB collect for percentage. F=0, ADA Normal AD collect F=1, ADA collect for percentage. The difference of two method is: Normal AD collect will output the AD value currently AD collect percentage will output the value of fuel percent.

			G=0
9	Change band	*$$$$$$,009,S#	S=1, work in 850/1900 S=0, work in 900/1800 *note: the default of parameter is S=0 and the GSM module support three frequency(900/1800/1900) ,if the unit of GSM module support the four frequency(850/900/1800/ 1900),then you could set the parameter to S=1.
10	Set APN,Username,Password	*$$$$$$,011,APN,Username,Password#	APN : APN string (must < 28 chars) User name: Your username (must < 28 chars) Password: Your password (must < 28 chars) * If haven't username or password, then left it blank. For example: *000000,011,CMNET,,## (It haven't username and password)
11	Set DNS	*$$$$$$,014, X,DNS1,DNS2#	X=0 Enable the DNS X=1 Disable the DNS DNS is the domain name server , xxx.xxx.xxx.xxx
12	Set IP Address Or Domain & port number	*$$$$$$,015,X,IP/DN,PORT#	X=0 use IP connect the server X=1 use DN connect the server IP : xxx.xxx.xxx.xxx DN:(domain name) www.xxx.com PORT : [1,65535]
13	Set the time intervals of GPRS Data	*$$$$$$,018,X,Y#	X (3 Digital) =0 stop send time interval GPRS =[10,999] Time interval (Unit: sec)

			Y (3 Digital) =0, stop send time interval GPRS = [1,999] After send YYY times stop. =999, continue send GPRS un-stop
14	Enable/Disable GPRS function	*$$$$$$,016,X#	X=0 Disable GPRS unction X=1 Enable GPRS Function This is the last step of GPRS setting.
15	Set the GPRS mode	*$$$$$$,019,X#	X=0, Use the UDP mode X=1, Use the TCP mode
16	Tremble sensor switch	*$$$$$$,021,XY#	X = 0 Disable Sleep mode X = 1 Enable Sleep mode Y = 0 Disable the tremble sensor Y = 1 Enable the tremble sensor
17	Set the Module	*$$$$$$,022,X,Y#	X=0, Close the GPS module when into sleep X=1, Open the GPS module when into sleep. Y=0, Close the GSM module when into sleep Y=1, Open the GSM module when into sleep
18	Enable/Disable I/O port	*$$$$$$,025,X,Y#	X=A means the output1(port 4) Y=0, Out port is low (the oil of circuit is restore) Y=1, Out port is high (the oil of circuit will cut off) For Example: *000000,025,A,1#
19	Heart Beat Switch	*$$$$$$,040,X#	X=0 Disable the heart beat function X=1 Enable the heart beat function
20	Heart Beat Intervals	*$$$$$$,041,X#	X is the heart beat interval, unit is minute [1<X<9999] X=0, Disable this function.
21	Heart Beat Init	*$$$$$$,042,0#	When receive this command, the heart beat

			will re-count time
22	Into sleep mode when without tremble for preset time	*$$$$$$,044,X#	After the tremble sensor don't tremble for X second, tracker will into sleep mode 30< X <65536 (Unit : second) For Example, configure AVL02 into sleep mode after no tremble for 30 second: *000000,044,30#
23	Wake up from Tremble	*$$$$$$,043,X#	After the tremble sensor continuous tremble for X second, tracker will wake up X=[1,255) (Unit : second) AVL02 Wake up from sleep mode after no tremble for 10 second: *000000,043,10#
24	Parking alarm	*$$$$$$,110,X#	X=1 Enable Tremble alarm function, then if the AVL02 is Trembling for 5s continually, it will alarm(0x30), X=0 Disable Tremble alarm function
25	Reading the IMEI number	*$$$$$$,801#	This command to require the IMEI number and the firmware of version.
26	Initialization Tracker	*$$$$$$,990,099#	It will set all parameter to factory default value (Excluding the Password).
27	Reboot by SMS command	*$$$$$$,991#	It will reboot the AVL02 by this SMS command.
28	Set Oil sensor	*$$$$$$,113,A,B#	A, B=[0,2000], the real voltage is [0,20V]. A is the empty fuel of corresponding voltage, B is the full fuel of corresponding voltage. *note: Every different types of car have different

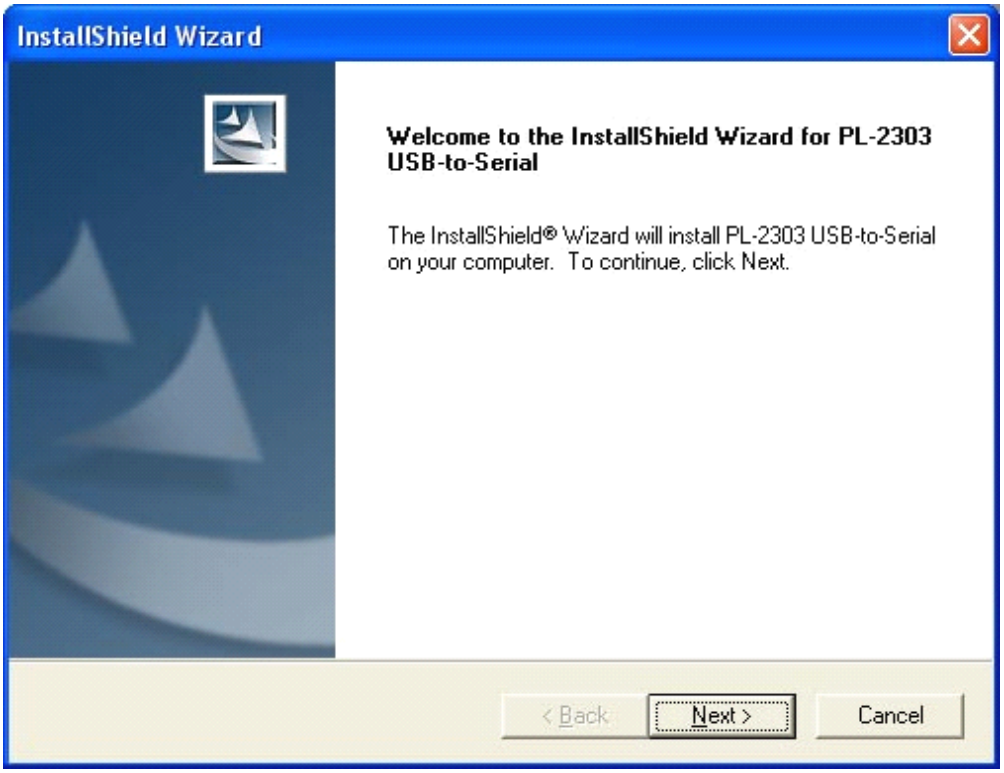
			corresponding relation. Pls test it by yourself, then set the command. Eg: *000000,113,100,500# Explain: it means empty fuel of corresponding voltage is 1V,and the he full fuel of corresponding voltage is 5V,if the AVL detect the voltage is 4V,then the value of fuel percentage is (4-1)/(5-1)=75%.
29	Set OutA Change	*$$$$$$,117,A,B,C,D#	A=[0,999]km/h , the thresold of speed. B=[0,60000] ms, the interval of outA off C=[0,60000] ms, the interval of OutA on D=[0,99], the times of OutA change If the speed is lower than, the OutA will off B seconds, then restore C seconds, repeat it D times. *note： because of the safety, you had better set the parameter like this: *000000,117,60,500,3000,5#
30	OutA Change switch	*$$$$$$,116,A#	A=1, active 117 command set . A=0, Don`t active 117 command set
31	Map Link	*$$$$$$,100#	the device wil reply a sms link .after clicking the sms link, you will get a segment of google map for the device location on your cell phone
32	By Miles Set the time intervals of GPRS Data	*$$$$$$,121,X,Y#	Used to decide whether to send mileage regularly features GPRS. X=0, Disable this function

			(Default) X=1, Enable this function Y=[0,60000]/meter The distance range can be set
33	Extend Setting	*$$$$$$,118,ABCDEFGH#	A=0, Disable send the interval GPRS data normally when trembles (Default) A=1, Enable send the interval GPRS data normally when trembles
			B=0, Disable send the interval GPRS data normally when Input 1 (Port 5) close(Default) B=1, Enable send the interval GPRS data normally when Input 1 (Port 5) close
			C=0, Disable send the interval GPRS data normally when Input 2 (Port 3) close(Default) C=1, Enable send the interval GPRS data normally when Input 2 (Port 3) close
			D=E=F=G=H=0, reserved

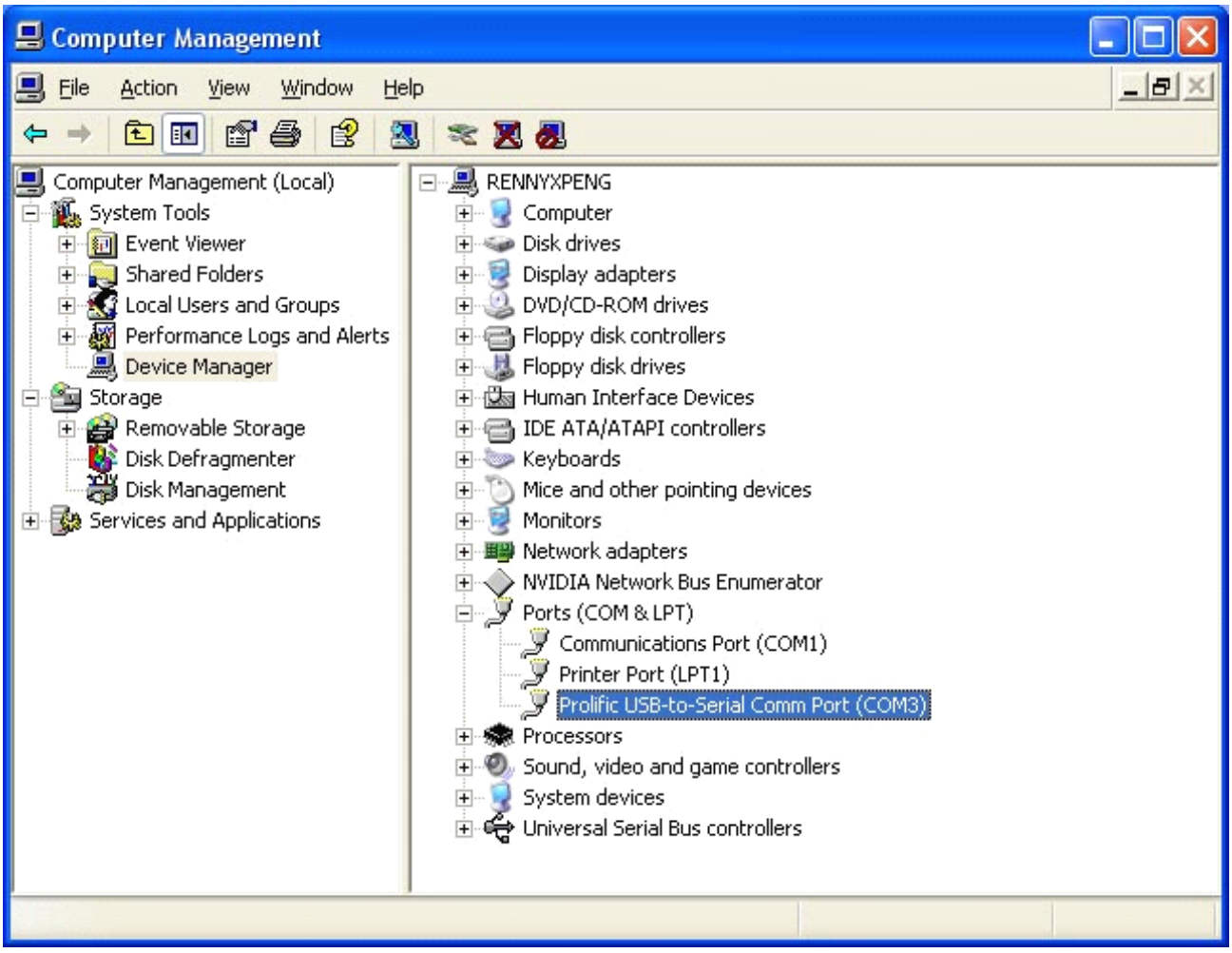
5. Update the firmware of the AVL

1）Install RS232 cable driver

A. At the first, Install the Driver for "USB Converter"


InstallShield Wizard
Welcome to the InstallShield Wizard for PL-2303 USB-to-Serial
The InstallShield® Wizard will install PL-2303 USB-to-Serial on your computer. To continue, click Next.
< Back
Next >
Cancel

B. Connect the AVL unit to PC through RS232 cable, View the com port that the cable used

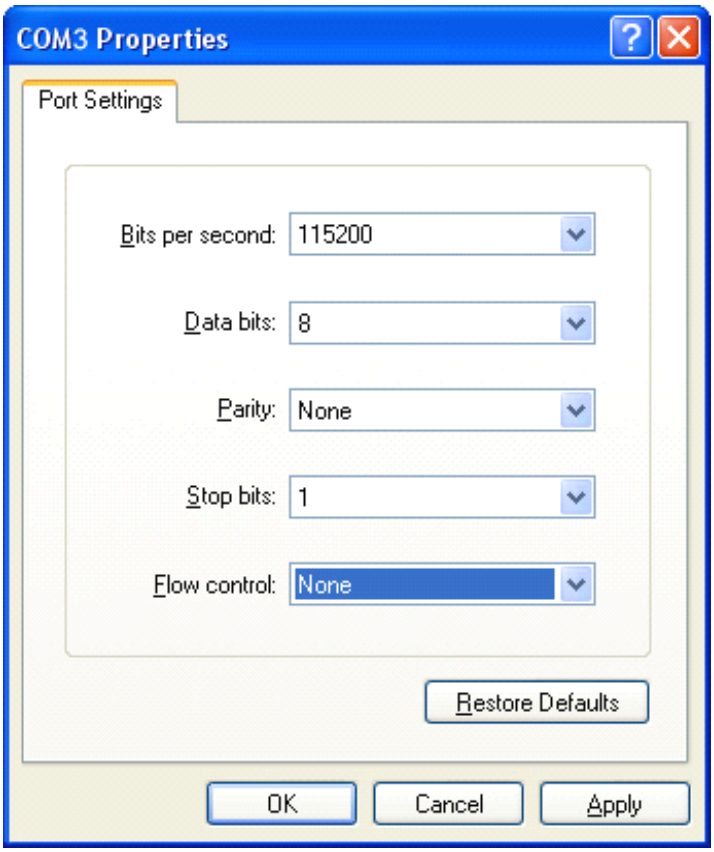


2）Turn on AVL device

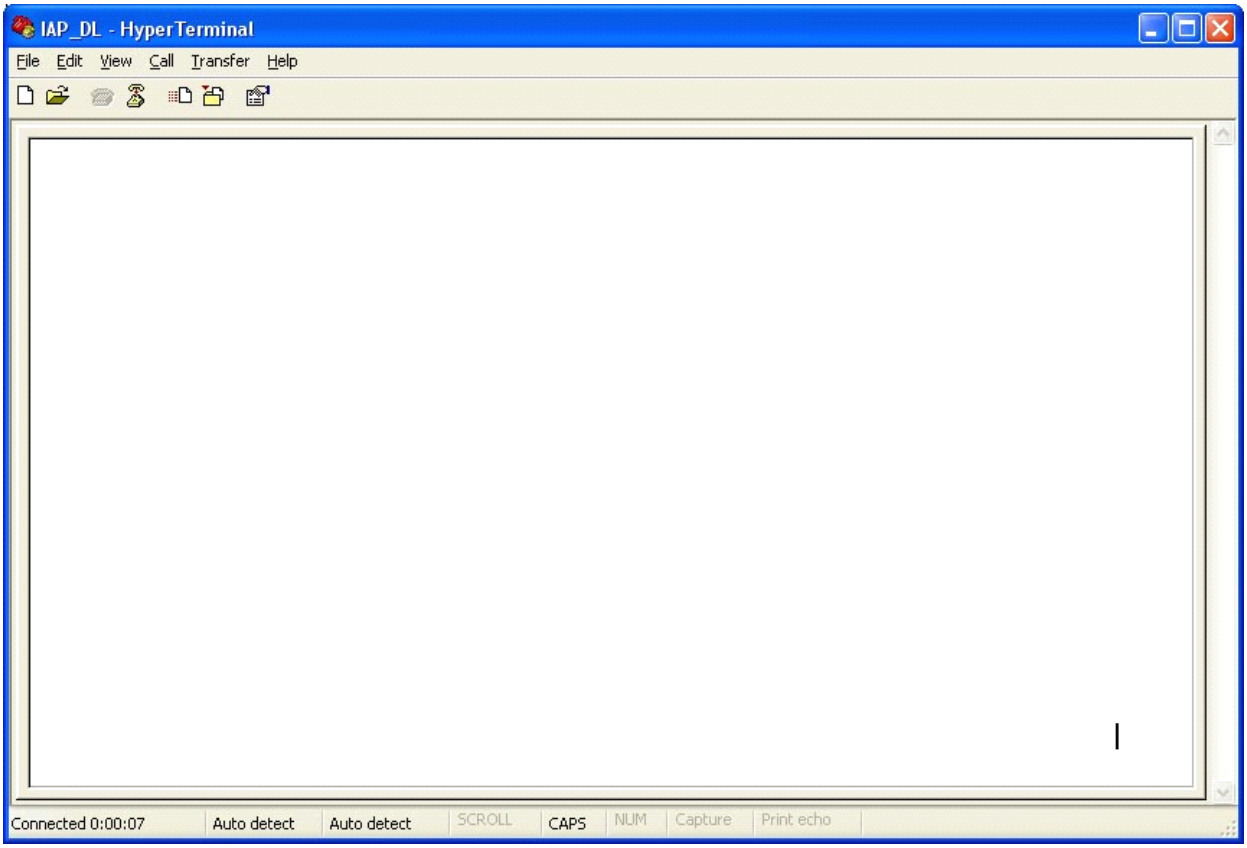
3）Build a New Hyper terminal connect, fill the name, example as IAP_DL

4）Choose the Com Port that the RS232 Cable used

Setup all the option like show in the picture follow

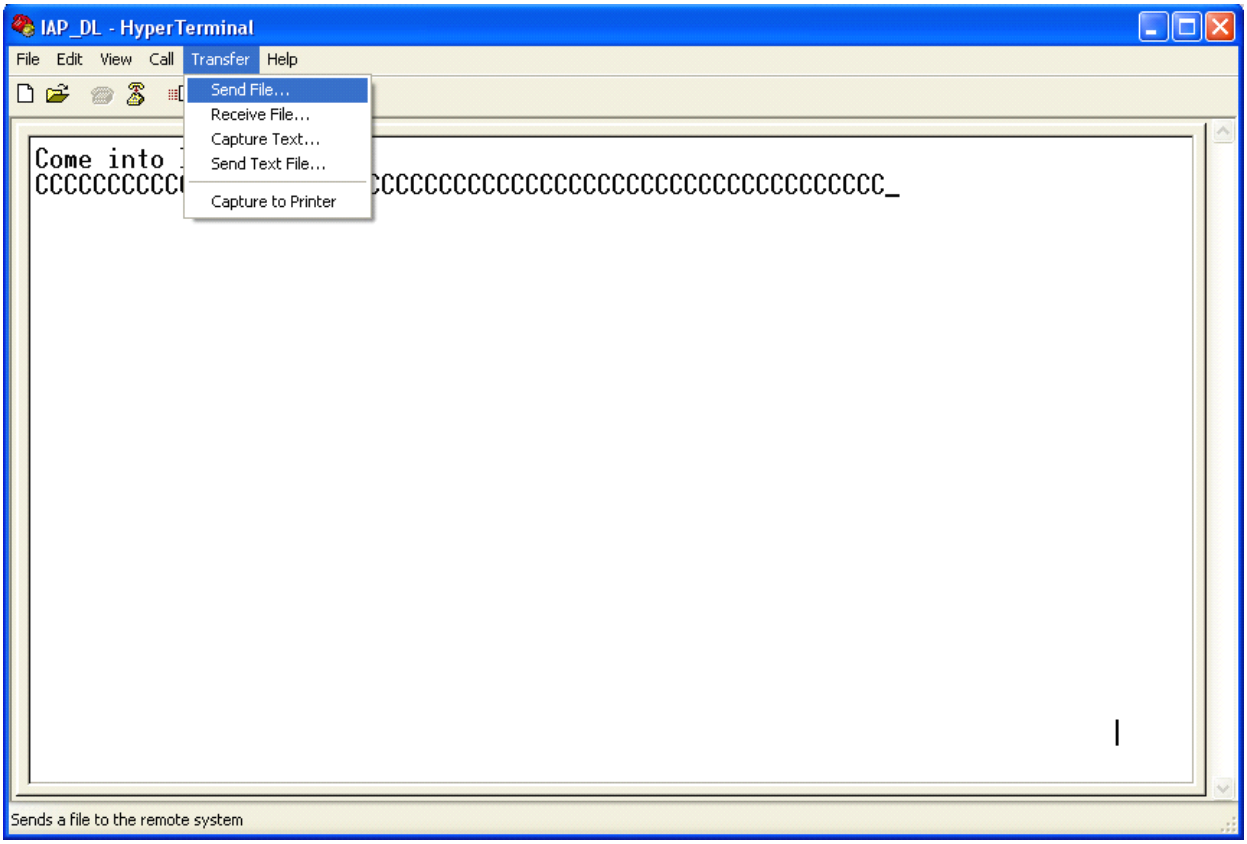


5）Into Configure Mode



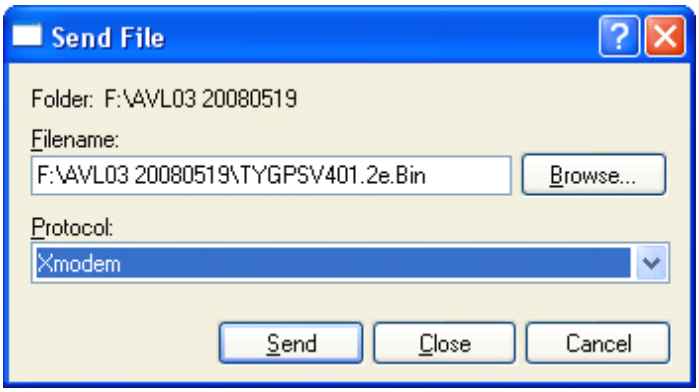
6）Turn Off AVL device

7）Press the Unit's SOS button and Turn on Power(Please hold it for several seconds)，Unit's GSM/GPS/Sensors LED will still light at same time， Hyper terminal will display the interface like the picture follow. Then choose Send file（Send-> Send File）

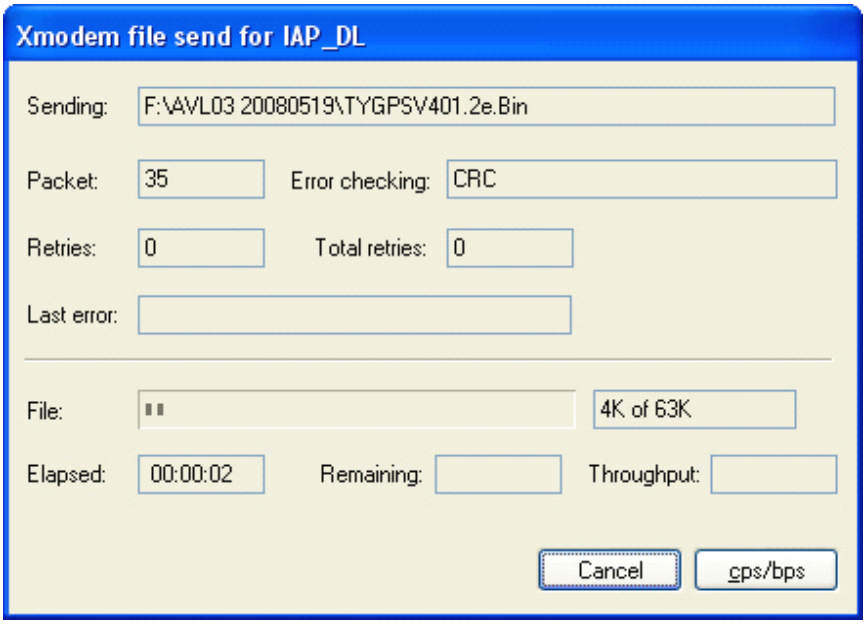


Choose the firmware that you want to Update;

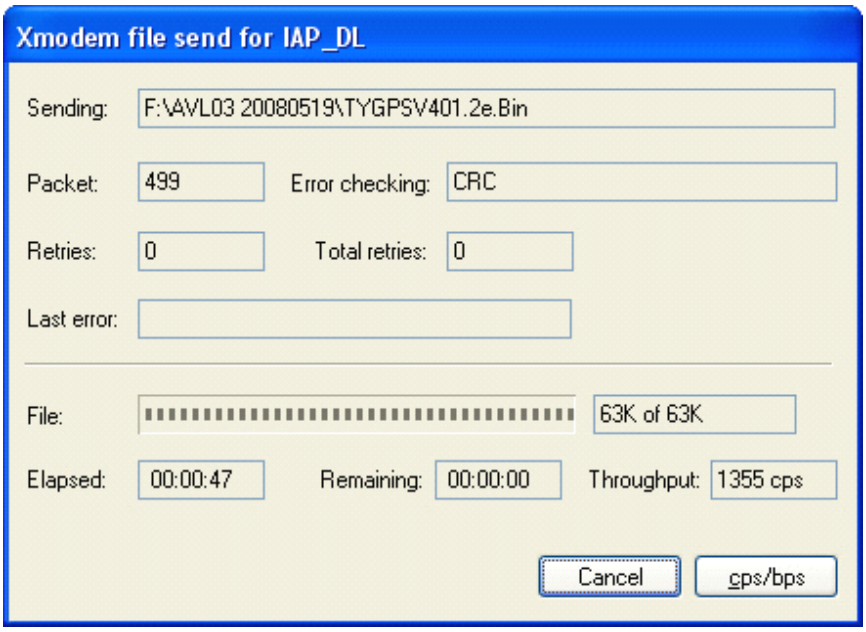
Protocol Choose: Xmodem



Press Send button, Will display a New Windows that show the update process.



(6) When finish Update, Tracker will reboot automatically, and the GSM/GPS/Sensors light will blink quickly. After about 3-5 mins, this interface will shut by itself. When the update is pressing, all indicator will off for 10 seconds, doesn't turn off power of AVL02, otherwise will cause MCU broken.



(7) When the AVL02 LED is blinking back to normal mode. Make sure about 2 mins later, then turn Off and Turn On AVL02 again. (At this times the firmware will load the parameter to the unit). Then the firmware updates finished.

6 Worldwide APN (Access Point Name) List

Country	Mobile operator	Access point name
Argentina	Personal	gprs.personal.com
Argentina	Unifon	internet.gprs.unifon.com.ar
Australia	Telstra	telstra.internet
Australia	Optus	internet
Australia	Three	3netaccess
Australia	Vodafone	internet
Austria	Max Online	gprsinternet
Austria	One	wap.one.at
Belgium	Orange	orangeinternet
Belgium	Mobistar	web.pro.be
Belgium	Proximus	internet.proximus.be
Bermuda	AT&T	proxy
Bermuda	Mobility	net.bm
Brazil	Claro	claro.com.br
Brazil	Oi	gprs.oi.com.br
Brazil	TIM	tim.br
Bulgaria	Mobiltel (Mtel)	inet-gprs.mtel.bg
Canada	Fido	internet.fido.ca
Canada	Rogers AT&T	internet.com
Chile	Entel PCS	imovil.entelpcs.cl bam.entelpcs.cl
Chile	Telefonica GSM	web.tmovil.cl
China	China Mobile	cmnet
Croatia	VIPNET	gprs.vipnet.hr
Czech Republic	Eurotel	internet
Czech Republic	Oskar	internet
Czech Republic	Oskar prepaid cards	ointernet
Czech Republic	T-Mobile	internet.t-mobile.cz

Denmark	TDCmobil	internet
Denmark	Orange	web.orange.dk
Eygpt	Vodafone	internet.vodafone.net
Dominican Republic	Orange Dominicana	orangenet.com.do
Finland	Telia Mobile	internet
Finland	DNA	internet
Finland	Sonera	internet
Finland	Radiolinja	internet
Finland	Saunalahti	saunalahti
France	Orange	orange.fr
France	SFR	websfr
France	Bouygues Telecom	eBouygTel.com
Germany	D2 Vodafone	web.vodafone.de
Germany	E-Plus	internet.eplus.de
Germany	O2	internet
Germany	Quam	quam.de
Germany	T-Mobile D1	internet.t-d1.de
Greece	Vodafone	internet.vodafone.gr
Greece	Telestet	gint.b-online.gr
Greece	Cosmote	internet
Hungary	Vodafone (Prepaid "Optimized")	vitamax.internet.vodafone.net
Hungary	Vodafone (Prepaid "Standard")	vitamax.snet.vodafone.net
Hungary	Vodafone (Postpaid "Optimized")	internet.vodafone.net
Hungary	Vodafone (Postpaid "Standard")	standardnet.vodafone.net
Hong Kong	CSL	internet
Hong Kong	Orange	web.orangehk.com
Hong Kong	New World	internet
Hong Kong	People	internet
Hong Kong	SmarTone	internet

Hong Kong	Sunday	internet
India	Orange, Hutch	www
Iceland	Siminn	gprs.simi.is
India	BPL Mobile	bplgprs.com
India	Airtel	airtelgprs.com
Indonesia	Telkomsel	internet
Ireland	O2	internet
Ireland	Vodafone	live.vodafone.com
Israel	Cellcom	internetg
Israel	Orange	internet
Italy	TIM	uni.tim.it ibox.tim.it
Italy	Vodafone Omnitel	web.omnitel.it
Italy	Wind	internet.wind
Latvia	Latvia Mobile Telefone	internet.lmt.lv
Luxembourg	LUXGSM	web.pt.lu
Luxembourg	Tango	internet
Malaysia	Celcom	celcom.net.my
Mexico	Movistar	internet.movistar.mx
Mexico	Telcel	internet.itelcel.com
Montenegro	Monet	gprs.monetcg.com
Netherlands	T-Mobile	internet
Netherlands	KPM Mobile	internet
Netherlands	Orange	internet
Netherlands	O2	internet
Netherlands	Vodafone (normal)	web.vodafone.nl
Netherlands	Vodafone (business)	office.vodafone.nl
New Zealand	Vodafone NZ	www.vodafone.net.nz
Norway	Netcom	internet.netcom.no

Norway	Telenor	internet
Pakistan	UFone	ufone.internet
Paraguay	Personal	internet
Paraguay	Tigo	internet.tigo.py
Philippines	Smart	internet
Philippines	Globe	internet.globe.com.ph
Poland	Era	erainternet
Poland	Idea	www.idea.pl
Poland	PlusGSM	www.plusgsm.pl
Portugal	Optimus	internet
Portugal	TMN	internet
Portugal	Vodafone (Telcel)	internet.vodafone.pt
Romania	Connex	internet.connex.ro
Romania	Orange	internet
Russia	BeeLine	internet.beeline.ru
Russia	Megafon	internet.nw
Russia	MTS	internet.mts.ru
Russia	PrimTel	internet.primtel.ru
Saudi Arabia	Saudi Telecom	Jawalnet.com.sa
Serbia-Montenegro	Mobtel Srbija	internet
Serbia-Montenegro	Telekom Srbija	gprsinternet
Singapore	M1	sunsurf
Singapore	Singtel	internet
Singapore	Starhub	shwapint
Slovakia	Eurotel	internet
Slovakia	Orange	internet
South Africa	MTN	internet
Spain	Amena	amenawap

Spain	Telefonica (Movistar)	movistar.es
Spain	Vodafone	airtelnet
Sweden	Telia	online.telia.se
Sweden	Vodafone SE	internet.vodafone.net
Switzerland	Swisscom	gprs.swisscom.ch
Switzerland	Orange CH	internet
Switzerland	sunrise	internet
Switzerland	UMC	www.umc.ua
Taiwan	Chunghwa Telecom	internet
Taiwan	Far EasTone	fetnet01
Taiwan	KG Telecom	internet
Taiwan	Taiwan Cellular	internet
Thailand	AIS	internet
Thailand	DTAC	www.dtac.co.th
Turkey	Avea	internet
Turkey	Aycell	aycell
Turkey	Telsim	telsim
Turkey	Turkcell	internet
UK	Jersey Telecom	pepper
UK	O2	mobile.o2.co.uk
UK	T-Mobile	general.t-mobile.co.uk
UK	Vodafone UK	internet
UK	Orange	orangeinternet
Ukraine	Kyivstar GSM	www.kyivstar.net
Ukraine	UMC	www.umc.ua
USA	T-Mobile	internet2.voicestream.com
USA	AT&T	proxy
USA	Cingular	isp.cingular
Venezuela	Digital TIM	gprsweb.digitel.ve